

ABSTRACT

The present invention provides a surface-treated steel sheet including a steel sheet; a plating layer provided on at least one of the surfaces of the steel sheet, the plating layer containing at least one metal selected from the group consisting of zinc and aluminum; a first layer film provided on the surface of the plating layer and containing (α) 1 to 2000 mg/m² of silica in terms of SiO₂, (β) a total of 1 to 1000 mg/m² of phosphoric acid groups in terms of P, (γ) a total of 0.5 to 800 mg/m² of at least one metal selected from the group consisting of Mg, Mn, and Al in terms of a metal element, and (δ) 0.1 to 50 mg/m² of a tetravalent vanadium compound in terms of V; and a second layer film formed to a thickness of 0.1 to 5 μm on the first layer film and containing a resin (A) having at least one type of functional group selected from the group consisting of OH and COOH groups, and at least one rust-proofing additive (B) selected from the group consisting of (a) a phosphate, (b) Ca ion-exchanged silica, (c) a molybdate, (d) silicon oxide, and (e) at least one organic compound selected from the group consisting of triazoles, thiols, thiadiazoles, thiazoles, and thiurams. The surface-treated steel sheet has excellent corrosion resistance without containing hexavalent chromium in a coating, and also has excellent conductivity and coating appearance.